Attorney Docket No. 7593 CO1
Customer No. 49459

REMARKS

Claims 1,9, and 10 have been amended. No new matter has been added.

Rejection based upon 35 U.S.C. §103

A. Chattoraj et al. in view of Ridgway and McNeel

Claims 1-17 have been rejected under 35 U.S.C. §103(a) as being obvious over Chattoraj et al. in view of Ridgway et al. and McNeel et al.

Applicants respectfully traverse the Examiner's rejection.

Chatteroraj et al. discloses a method of monitoring both the planktonic and sessile microbial populations in an industrial water system, including boilers and cooling towers, comprising the steps of: a) adding a fluorogenic dye directly into said industrial water system and allowing said fluorogenic dye to react with any planktonic or sessile microbiological organisms present; b) providing means for measurement of the fluorescent signals of said fluorogenic dye in said industrial water system, with the first fluorescent signal measurement being that of the fluorogenic dye and the second fluorescent signal measurement being that of the reacted fluorogenic dye; c) using said means for measurement of said fluorescent signals of said fluorogenic dye to measure the fluorescent signal of the fluorogenic dye and the fluorescent signal of the reacted fluorogenic dye, while discarding any measured fluorescent signal values below a predetermined noise level; d) calculating the Ratio of the measured fluorescent signal of the reacted fluorogenic dye to the fluorescent signal of the fluorogenic dye; and e) monitoring the change in calculated Ratio from step d) to determine the status of the planktonic and sessile microbiological populations in the industrial water system. This reference also discloses the additional steps of: 1) determining the optimal amount of biocide to be delivered to the industrial water system wherein said optimal amount is based upon the magnitude of said Ratio or the rate of change of said Ratio; and 2) delivering said optimal amount of biocide to the industrial water system. Moreover, the fluorogenic agent can be fed either by itself or in combination with water treatment agents that are typically fed into a cooling water system such as, but not limited to, scale and corrosion inhibitors. Chattoraj does not specifically discuss the application of its monitoring technique to a membrane separation system.

Ridgway teaches how biofouling is a widespread problem limiting the performance and application of reverse osmosis and other membrane separation processes. The primary source of microbial contamination is typically the system feedwater; surface waters in particular contain high numbers of microorganisms which lead to microbial problems. With respect to monitoring and detecting membrane foulants, Ridgeway teaches the use of optical microscopy, scanning and transmission microscopy, atomic force microscopy, x-ray fluorescence emission microscopy, attenuated total reflection Fourier transform infrared spectrometry (ATR-FTIR), energy-dispersive x-ray microanalysis, and Auger spectroscopy. The reference also teaches that the information obtained from optical microscopy can be extended and quantified by the use of organic dyes which preferentially react with fluorescent probes such as 2,4-diamidino-2-phenylindole, 5-cyano-2,3-ditoyl tetrazolium chloride, and rhodamine. All these techniques directly measure membrane fouling with the detriment that the membrane has to be destroyed and extracted from the membrane system. Nowhere is there any mention of monitoring biofouling in a membrane separation system by fluorescence.

McNeel teaches a composition and method of controlling fouling in an aqueous system that contains a membrane separation system, e.g. a reverse osmosis membrane. More specifically, the composition contains an anionic antiscalant and a cationically charged biocide. Testing included the measurement of biocide in a permeate stream, a concentrate stream, and a feed stream by a Total Organic Carbon (TOC) test.

A rejection based on obviousness would fail because a person of ordinary skill in the art, possessed with the understandings and knowledge reflected in the prior art, and motivated by the general problem in the art of membrane separation systems, would not have been lead to make the combination of the claims.

The disclosures, which form the basis of the Examiner's rejection, convey the following understanding in the art: fluorescence can be used as a tool for monitoring biofouling in an industrial water system and not specifically a membrane separation system and that the level of microorganisms in a system can be determined by adding a fluorogenic agent that reacts with the microorganisms in the system; and the presence of foulants in a reverse osmosis membrane system can be monitored when the membrane separation system is shut down, the membrane is extracted, and the membrane is subsequently analyzed out of the system, e.g. by reacting a portion of the membrane with a fluorescent dye for the presence of foulants (staining). The

disclosures also teach that the total organic content (TOC) in a permeate stream, concentrate stream, and a feed stream have been measured to see whether a biocide is effective in reducing membrane fouling.

The claimed invention pertains to a method of monitoring biofouling in a membrane separation process by reacting a fluorogenic agent with at least one microorganism in the concentrate stream and the feed stream.

Based upon the understanding in the art, several reasons support the conclusion that one of ordinary skill in the art would not have been lead to make the combination of the claims.

First, one of ordinary skill in the art would not be motivated to combine the teachings of Chattoraj and Ridgway because the methods of monitoring a membrane system are completely different one another; one system requires the dismantling of a membrane system to study fluorescence of microbiological species as opposed to the other system which provides and in-system measurement of the microbiological species in an industrial water system.

Second, one of ordinary skill in the art would not be motivated to combine the teachings of Chattoraj with McNeel because the protocol for monitoring fouling of a membrane system are completely different. More specifically, one involves measuring TOC as a method of measuring presence of microorganisms and the efficacy of a biocide, and the other method is a method of determining the presence of a microbiological species by adding a fluorogenic agent that reacts with the microbiological species.

Thirdly, considering the first and second reasons presented, it would be further unlikely that one of ordinary skill in the art would combine select teachings of knowledge/pick or choose parts of disclosures in formulating the claimed invention when all three disclosure all involve completely different techniques for monitoring biological systems.

The only motivation to make the claimed invention would come from the Applicant's disclosure, hindsight reconstruction, and that bases for motivation is not permitted by law. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991); MPEP 2143. In view of the foregoing, Applicants request that the Examiner allow claim 1.

Considering that claims 2-17 depend upon an allowable base claim, claim 1, Applicants request that the Examiner allow claims 2-17.

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B. Zeiher et al. in view of Chattoraj

Claims 1-14, 16, and 17 have been rejected under 35. U.S.C. § 103(a) as being obvious over Zeiher et al. (U.S. Patent No. 6,838,002) in view of Chattoraj.

Zeiher et al. was published on January 4, 2005 and its 35 U.S.C. 102(e) date is March 28, 2002.

35 U.S.C. 103 (c) states "[s]ubject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the claimed invention was made, owned by the same person or subject to an obligation of assignment to the same person."

37 C.F.R. 1.104 states "[s]ubject matter which is developed by another person which qualifies as prior art only under 35 U.S.C. 102 (e), (f) or (g) may be used as prior art under 35 U.S.C. 103 against a claimed invention unless the entire rights to the subject matter and the claimed invention were commonly owned by the same person or subject to an obligation of assignment to the same person at the time the claimed invention was made."

MPEP 706.02(l)(2) Establishing Common Ownership - 700 Examination of Applications states the following:

> The following statement is sufficient evidence to establish common ownership of, or an obligation for assignment to, the same person(s) or organizations(s):
> Applications and references (whether patents, patent applications, patent application publications, etc.) will be considered by the examiner to be owned by, or subject to an obligation of assignment to the same person, at the time the invention was made, <u>if the applicant(s) or an attorney or agent of record makes a statement to the effect that the application and the reference were, at the time the invention was made, owned by, or subject to an obligation of assignment to, the same person.</u>
>
> See "Guidelines Setting Forth a Modified Policy Concerning the Evidence of Common Ownership, or an Obligation of Assignment to the Same Person, as Required by 35 U.S.C. 103 (c)" 1241 O.G. 96 (December 26, 2000). The applicant(s) or the representative(s) of record have the best knowledge of the ownership of their

application(s) and reference(s), and their statement of such is sufficient evidence because of their paramount obligation of candor and good faith to the USPTO.

The statement concerning common ownership should be clear and conspicuous (e.g., on a separate piece of paper or in a separately labeled section) in order to ensure that the examiner quickly notices the statement. Applicants may, but are not required to, submit further evidence, such as assignment records, affidavits or declarations by the common owner, or court decisions, *in addition to* the above-mentioned statement concerning common ownership. (Emphasis added).

STATEMENT RE: OBLIGATION OF ASSIGNMENT

Subject matter developed by another person, Zeiher et al, qualifies as prior art only under section 102(e).

Applicants assert that subject matter by Zeiher et al. and the claimed invention were, at the time the claimed invention was made, subject to an obligation of assignment to the same person.

This assertion is based upon the following. As of the effective filing date of the claimed invention, July 23, 2002, both Zeiher and the claimed invention were subject to obligation of assignment to Ondeo Nalco Company. As of the actual filing date of the claimed invention, November 25, 2003, both Zeiher and the claimed invention were subject to obligation of assignment to Nalco Company because the name Ondeo Nalco Company was changed to Nalco Company on November 4, 2003.

Based upon the foregoing argument, Applicants assert that Zeiher is disqualified, and Applicants request that this rejection be removed and that the claims are allowed.

Rejection based upon Double Patenting

a. Chattoraj in view of Ridgeway and McNeel

Claims 1-5 and 9-17 have been rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-15 of U.S. Patent No. 6,329,165 B1 in view of Ridgway et al and McNeel.

Applicants respectfully traverse the Examiner's rejection.

Chatteroraj et al. discloses a method of monitoring both the planktonic and sessile microbial populations in an industrial water system, including boilers and cooling towers, comprising the steps of: a) adding a fluorogenic dye directly into said industrial water system and allowing said fluorogenic dye to react with any planktonic or sessile microbiological organisms present; b) providing means for measurement of the fluorescent signals of said fluorogenic dye in said industrial water system, with the first fluorescent signal measurement being that of the fluorogenic dye and the second fluorescent signal measurement being that of the reacted fluorogenic dye; c) using said means for measurement of said fluorescent signals of said fluorogenic dye to measure the fluorescent signal of the fluorogenic dye and the fluorescent signal of the reacted fluorogenic dye, while discarding any measured fluorescent signal values below a predetermined noise level; d) calculating the Ratio of the measured fluorescent signal of the reacted fluorogenic dye to the fluorescent signal of the fluorogenic dye; and e) monitoring the change in calculated Ratio from step d) to determine the status of the planktonic and sessile microbiological populations in the industrial water system. This reference also discloses the additional steps of: 1) determining the optimal amount of biocide to be delivered to the industrial water system wherein said optimal amount is based upon the magnitude of said Ratio or the rate of change of said Ratio; and 2) delivering said optimal amount of biocide to the industrial water system. Moreover, the fluorogenic agent can be fed either by itself or in combination with water treatment agents that are typically fed into a cooling water system such as, but not limited to, scale and corrosion inhibitors. Chattoraj does not specifically discuss the application of its monitoring technique to a membrane separation system.

Ridgway teaches how biofouling is a widespread problem limiting the performance and application of reverse osmosis and other membrane separation processes. The primary source of microbial contamination is typically the system feedwater; surface waters in particular contain high numbers of microorganisms which lead to microbial problems. With respect to monitoring and detecting membrane foulants, Ridgeway teaches the use of optical microscopy, scanning and transmission microscopy, atomic force microscopy, x-ray fluorescence emission microscopy, attenuated total reflection Fourier transform infrared spectrometry (ATR-FTIR), energy-dispersive x-ray microanalysis, and Auger spectroscopy. The reference also teaches that the information obtained from optical microscopy can be extended and quantified by the use of

organic dyes which preferentially react with fluorescent probes such as 2,4-diamidino-2-phenylindole, 5-cyano-2,3-ditoyl tetrazolium chloride, and rhodamine. All these techniques directly measure membrane fouling with the detriment that the membrane has to be destroyed and extracted from the membrane system. Nowhere is there any mention of monitoring biofouling in a membrane separation system by fluorescence.

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A rejection based on obviousness would fail because a person of ordinary skill in the art, possessed with the understandings and knowledge reflected in the prior art, and motivated by the general problem in the art of membrane separation systems, would not have been lead to make the combination of the claims.

The disclosures, which form the basis of the Examiner's rejection, convey the following understanding in the art: fluorescence can be used as a tool for monitoring biofouling in an industrial water system and not specifically a membrane separation system and that the level of microorganisms in a system can be determined by adding a fluorogenic agent that reacts with the microorganisms in the system; and the presence of foulants in a reverse osmosis membrane system can be monitored when the membrane separation system is shut down, the membrane is extracted, and the membrane is subsequently analyzed out of the system, e.g. by reacting a portion of the membrane with a fluorescent dye for the presence of foulants (staining). The disclosures also teach that the total organic content (TOC) in a permeate stream, concentrate stream, and a feed stream have been measured to see whether a biocide is effective in reducing membrane fouling.

The claimed invention pertains to a method of monitoring biofouling in a membrane separation process by reacting a fluorogenic agent with at least one microorganism in the concentrate stream and the feed stream.

Based upon the understanding in the art, several reasons support the conclusion that one of ordinary skill in the art would not have been lead to make the combination of the claims.

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Thirdly, considering the first and second reasons presented, it would be further unlikely that one of ordinary skill in the art would combine select teachings of knowledge/pick or choose parts of disclosures in formulating the claimed invention when all three disclosure all involve completely different techniques for monitoring biological systems.

The only motivation to make the claimed invention would come from the Applicant's disclosure, hindsight reconstruction, and that bases for motivation is not permitted by law. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991); MPEP 2143. In view of the foregoing, Applicants request that the Examiner allow claim 1.

Considering that claims 2-5 and 9-17 depend upon an allowable base claim, claim 1, Applicants request that the Examiner allow claims 2-5 and 9-17.

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CONCLUSION

Applicants respectfully request that a Notice of Allowance be sent for all pending claims.

Respectfully Submitted,

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Date: 11/15/07